

Amendments to the Claims

Claim 1 (Currently amended): A method of automated seed conditioning of a plurality of sets of previously harvested seed in batches through two or more operations upon the seed between an input and an output, comprising:

- (a) providing, prior to the input, a unique identifier for each set of seed, wherein said each set comprises a plurality of seed separated from its plant;
- (b) conveying each set of seed, segregated from other sets of seed, from the input to the output ~~without an individual container for each set or monitoring a physical location correlated to a pre-defined physical space coordinate system;~~
- (c) automatically sequentially performing said two or more operations on each set of seed between the input and output while tracking of and progression of each set of seed through said operations is controlled and while maintaining segregation of each set of seed from other sets of seed, the operations comprising cleaning the seed and sorting the seed, and the tracking comprising monitoring of one or more of ~~the set consisting of~~ (1) state of said conveying, (2) time, and (3) a said operation relative to each said set of seed, the operations being programmable dependent upon selected parameters, the parameters being related to differences between different types of seed or differences between conditions of the same type of seed;
- (d) conveying each set of seed to the output wherein said tracking provides information used to verify which set of seed is at the output;

- (e) automatically accumulating at the output an end product plurality of seed from each set of seed after performing said operations and storing information about the end product plurality of seed correlated to the identifier;
 - (f) separating undesired non-seed or seed from the end product plurality of seed;
 - (g) maintaining segregation of each said end product plurality of seed from each set of seed from end product plurality of seed of other sets of seed;
- so that identity and progression of each set of seed between input and output is known and co-mingling of seed from different sets of seed is avoided.

Claims 2-3 (Cancelled).

Claim 4 (Original): The method of claim 1 further comprising monitoring said operations for conditions indicative of an error.

Claim 5 (Previously presented): The method of claim 4 wherein the conditions indicative of an error comprise one or more of (a) over capacity, (b) possibility of commingling of sets of seed, (c) improper operation; (d) lack of validation against a data set; (e) improper set of seed relative to operational set-up.

Claim 6 (Previously presented): The method of claim 1 further comprising regulating movement of a set of seed to deter reaching over-capacity for any operation.

Claim 7 (Cancelled)

Claim 8 (Currently amended): The method of claim 6 wherein control of progression comprises maintaining spatial separation of each set of seed while operating on the seed and allowing recovery of each set of seed while preserving its identity from other sets of seed.

Claim 9 (Currently amended): The method of claim 1 further comprising conveying said set of seed to the output wherein said tracking provides information is used to verify which set of seed is at the output.

Claim 10 (Previously presented): The method of claim 1 further comprising conveying said set of seed to and through said one or more operations, said tracking providing information to verify the location of the set of seed between input and output.

Claim 11 (Previously presented): The method of claim 9 wherein the tracking comprises tracking a state of the operations relative to the set of seed.

Claim 12 (Previously presented): The method of claim 11 wherein the state of the operations includes monitoring status of devices that control conveyance of the set of seed.

Claim 13 (Original): The method of claim 1 wherein the sets of seed are seed samples.

Claim 14 (Previously presented): The method of claim 13 wherein the seed samples are related to a plant breeding program.

Claim 15 (Previously presented): The method of claim 14 wherein the plant breeding program is a corn breeding program.

Claim 16 (Previously presented): The method of claim 14 wherein the plant breeding program is a soybean breeding program.

Claim 17 (Currently amended): The method of claim 1 wherein the operations further comprise one or more of (a) separating ~~a set of seed~~ from a carrier or adhering vegetation, tissues or structure, ~~(b) cleaning, (c) discriminating between seed in the set of seed, (d) (b) counting seed, (e) (c) measuring moisture content of seed, (f) (d) measuring weight of seed, (g) (e) evaluating seed non-destructively, (h) and (f) measuring temperature of seed.~~

Claim 18 (Original): The method of claim 1 further comprising directing said end product into a container.

Claim 19 (Previously presented): The method of claim 5 wherein said data set comprises a data base, a spreadsheet, or a mapped memory.

Claim 20 (Previously presented): The method of claim 5 further comprising generating a label for the set of seed or subset thereof based at least in part on information from the data set.

Claim 21 (Original): The method of claim 1 wherein the operations are self-cleaning.

Claim 22 (Previously presented): The method of claim 21 wherein the operations comprise a cleaning/size sorting operation wherein the cleaning is self-cleaning.

Claim 23 (Original): The method of claim 1 further comprising generating a notification for transmission to a remote location related to accumulated data regarding the set of seed and communicating the notification.

Claim 24 (Previously presented): The method of claim 1 further comprising separating undesired non-seed material and a portion of seed from the set of seed during said one or more operations.

Claim 25 (Previously presented): The method of claim 24 wherein said separated non-seed material and said a portion of seed are either discarded or accumulated for possible future use.

Claims 26-118 (Cancelled).

Claim 119 (Previously presented): A method of automated seed conditioning of a plurality of sets of previously harvested seed in batches through two or more operations upon the seed between an input and an output, comprising:

- (a) providing, prior to the input, a unique identifier for each set of seed, wherein said each set comprises a plurality of seed separated from its plant;

- (b) conveying each set of seed, segregated from other sets of seed, from the input to the output ~~without an individual container for each set or monitoring a physical location correlated to a pre-defined physical space coordinate system;~~
- (c) automatically sequentially performing said two or more operations on each set of seed between the input and output while tracking of and progression of each set of seed through said operations is controlled and while maintaining segregation of each set of seed from other sets of seed, the operations comprising cleaning the seed and sorting the seed, and the tracking comprising monitoring of one or more ~~of the set consisting of~~ (1) state of said conveying, (2) time, and (3) a said operation relative to each said set of seed;
- (d) conveying each set of seed to the output wherein said tracking provides information used to verify which set of seed is at the output;
- (e) automatically accumulating at the output an end product plurality of seed from each set of seed after performing said operations and storing information about the end product plurality of seed correlated to the identifier, further comprising separating undesired non-seed material and a portion of seed from ~~the each~~ set of seed during said one or more operations, so that said separated non-seed material and said portion of seed are either discarded or accumulated for possible future use;
- (f) maintaining segregation of said end product from each set of seed from end product of other sets of seed;

so that identity and progression of each set of seed between input and output is known and co-mingling of seed from different sets of seed is avoided.

Claims 120-121 (Cancelled).

Claim 122 (Previously presented): The method of claim 119 further comprising monitoring said operations for conditions indicative of an error.

Claim 123 (Previously presented): The method of claim 122 wherein the conditions indicative of an error comprise one or more of (a) over capacity, (b) possibility of commingling of sets of seed, (c) improper operation; (d) lack of validation against a data set; (e) improper set of seed relative to operational set-up.

Claim 124 (Previously presented): The method of claim 119 further comprising regulating movement of a set of seed to deter reaching over-capacity for any operation.

Claim 125 (Cancelled).

Claim 126 (Currently amended): The method of claim 124 wherein control of progression comprises maintaining spatial separation of each set of seed while operating on the seed and allowing recovery of each set of seed while preserving its identity from other sets of seed.

Claim 127 (Currently amended): The method of claim 119 further comprising conveying said set of seed to the output wherein said tracking provides information is used to verify which set of seed is at the output.

Claim 128 (Previously presented): The method of claim 119 further comprising conveying said set of seed to and through said one or more operations, said tracking providing information to verify the location of the set of seed between input and output.

Claim 129 (Previously presented): The method of claim 127 wherein the tracking comprises tracking a state of the operations relative to the set of seed.

Claim 130 (Previously presented): The method of claim 129 wherein the state of the operations includes monitoring status of devices that control conveyance of the set of seed.

Claim 131 (Previously presented): The method of claim 119 wherein the sets of seed are seed samples.

Claim 132 (Previously presented): The method of claim 131 wherein the seed samples are related to a plant breeding program.

Claim 133 (Previously presented): The method of claim 132 wherein the plant breeding program is a corn breeding program.

Claim 134 (Previously presented): The method of claim 132 wherein the plant breeding program is a soybean breeding program.

Claim 135 (Currently amended): The method of claim 119 wherein the operations further comprise one or more of (a) separating a ~~set of seed~~ from a carrier or adhering vegetation, tissues or structure, ~~(b) cleaning, (c) discriminating between seed in the set of seed, (d) (b) counting seed, (e) (c) measuring moisture content of seed, (f) (d) measuring weight of seed, (g) (e)~~ evaluating seed non-destructively, ~~(h) and (f)~~ measuring temperature of seed.

Claim 136 (Previously presented): The method of claim 119 further comprising directing said end product into a container.

Claim 137 (Previously presented): The method of claim 123 wherein said data set comprises a data base, a spreadsheet, or a mapped memory.

Claim 138 (Previously presented): The method of claim 123 further comprising generating a label for the set of seed or subset thereof based at least in part on information from the data set.

Claim 139 (Previously presented): The method of claim 119 wherein the operations are self-cleaning.

Claim 140 (Previously presented): The method of claim 139 wherein the operations comprise a cleaning/size sorting operation wherein the cleaning is self-cleaning.

Claim 141 (Previously presented): The method of claim 119 further comprising generating a notification for transmission to a remote location related to accumulated data regarding the set of seed and communicating the notification.

Claim 142 (Previously presented): The method of claim 119 wherein the operations are programmable dependent upon selected parameters.

Claim 143 (Previously presented): The method of claim 142 wherein the parameters are related to differences between different types of seed or differences between conditions of the same type of seed.

Claim 144 (New): A method of automated seed conditioning of a plurality of sets of previously harvested unconditioned seed through two or more operations upon individual seed of each set between an input and an output, comprising:

- (a) providing, prior to the input, a unique identifier for each set of unconditioned seed, wherein said each set of unconditioned seed comprises a plurality of individual seed at least substantially separated from its plant;
- (b) introducing each set of unconditioned seed at the input serially but segregated from other sets of seed;
- (c) delivering conditioned sets of seed at the output serially but segregated from other sets of seed by
 - (i) automatically conveying each set of seed serially and segregated from other sets of seed to each of said two or more operations;

- (ii) automatically performing each of said two or more operations on one set of seed at a time, but whereas the operations are performed on individual seed of each set of seed, the operations comprising
 - (1) separating non-seed material from seed of each set of seed by discriminating between individual seeds and non-seed material and
 - (2) separating desired seed from non-desired seed by discriminating between individual seeds, and
 - (iii) maintaining spatial separation of each set of seed from other sets of seed by controlling one or more of (1) state of said conveying or a said operation or (2) timing of said conveying or a said operation;
 - (d) automatically accumulating at the output, correlated to its said identifier, each conditioned set of seed serially and segregated from other sets of seed by isolation, containment, or packaging, each set of conditioned seed being derived from each unconditioned set of seed by the operations;
- thereby allowing both preservation of identity between multiple sets of seed while performing seed conditioning operations on individual seed of each set.

Claim 145 (New): The method of claim 144 wherein the sets of seed are seed samples.

Claim 146 (New): The method of claim 145 wherein the seed samples are related to a plant breeding program.

Claim 147 (New): The method of claim 146 wherein the plant breeding program is a corn breeding program.

Claim 148 (New): The method of claim 146 wherein the plant breeding program is a soybean breeding program.

Claim 149 (New): The method of claim 144 wherein the operations further comprise one or more of (a) separating seed from a carrier or adhering vegetation, tissues or structure, (b) counting seed, (c) measuring moisture content of seed, (d) measuring weight of seed, (e) evaluating seed non-destructively, and (f) measuring temperature of seed.

Claim 150 (New): A method of automated seed conditioning of a plurality of unconditioned sets of previously harvested seed through two or more operations upon individual seed of each set between an input and an output, comprising:

- (a) providing, prior to the input, a unique identifier for each set of unconditioned seed, wherein said each set of unconditioned seed comprises a plurality of individual seed at least substantially separated from its plant;
- (b) introducing each set of unconditioned seed at the input serially but segregated from other sets of seed;
- (c) delivering conditioned sets of seed at the output serially but segregated from other sets of seed by
 - (i) automatically conveying each set of seed serially and segregated from other sets of seed to each of said two or more operations;

- (ii) automatically performing each of said two or more operations on one set of seed at a time, but whereas the operations are performed on individual seed of each set of seed, the operations comprising
 - (1) separating non-seed material from seed of each set of seed by discriminating between individual seeds and non-seed material and separating desired seed from non-desired seed by discriminating between individual seeds, and
 - (2) maintaining spatial separation of each set of seed from other sets of seed by controlling one or more of (1) state of said conveying or a said operation or (2) timing of said conveying or a said operation;
- (d) automatically accumulating at the output, correlated to its identifier, each conditioned set of seed serially and segregated from other sets of seed by isolation, containment, or packaging, each set of conditioned seed being derived from each unconditioned set of seed by the operations,
- (e) discarding or accumulating for other use the separated non-seed material and a portion of seed from each set of seed during said one or more operations;
- (f) thereby allowing both preservation of identity between multiple sets of seed while performing seed conditioning operations on individual seed of each set.